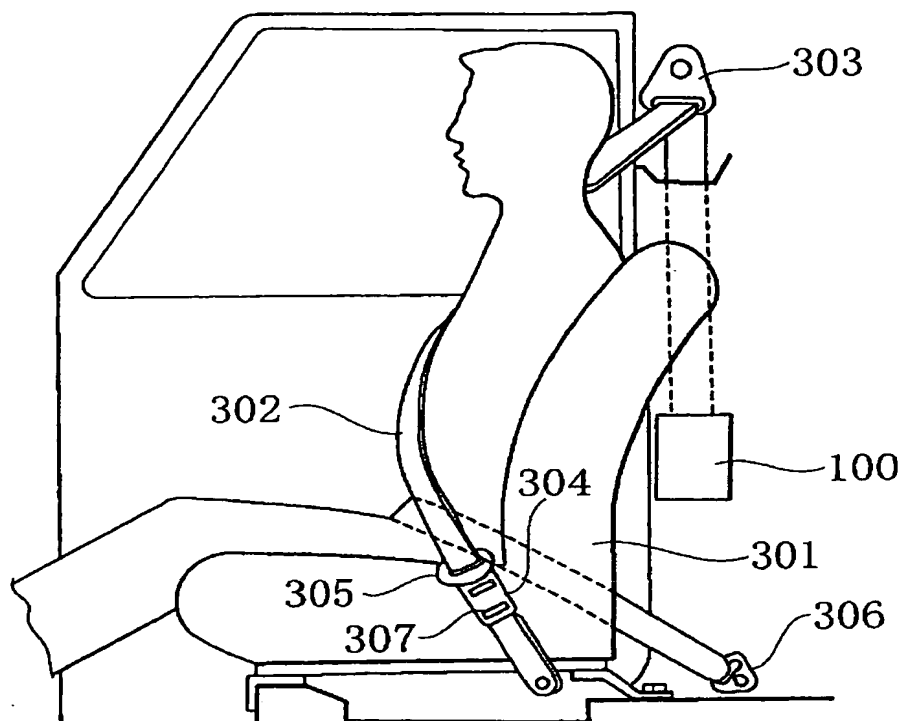
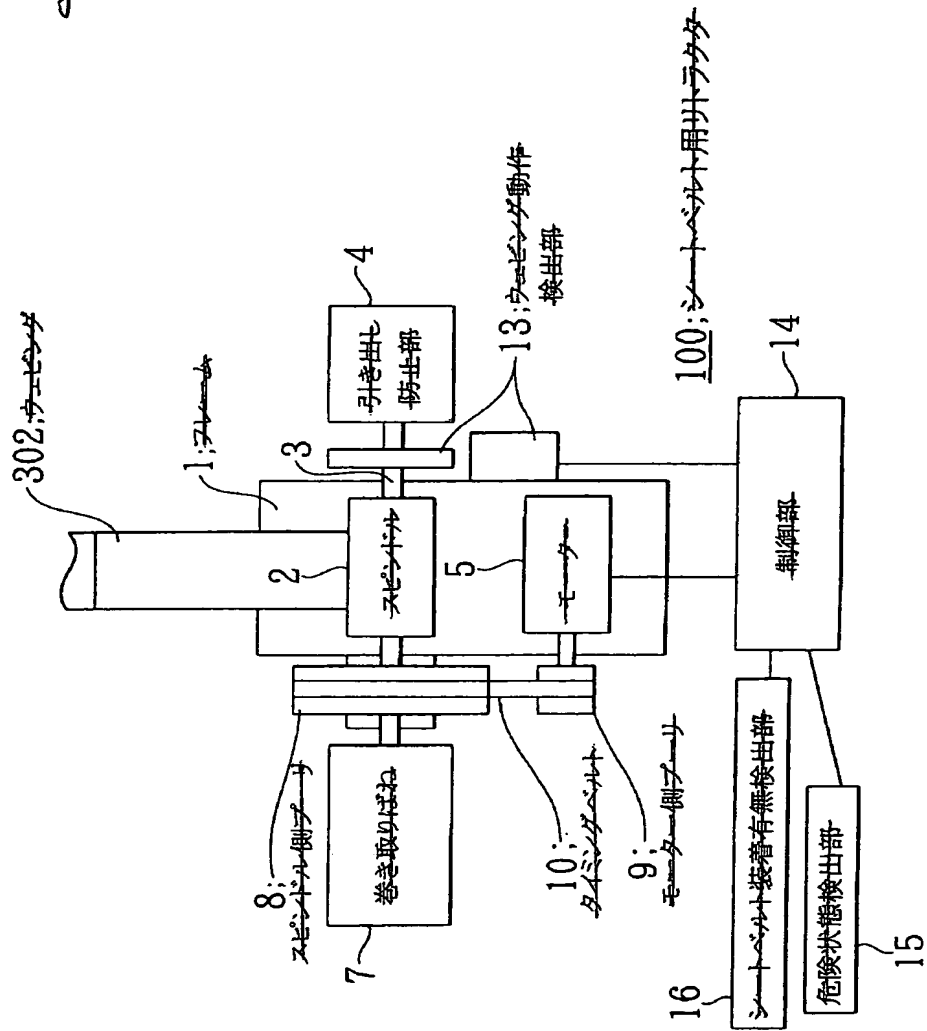


第1図

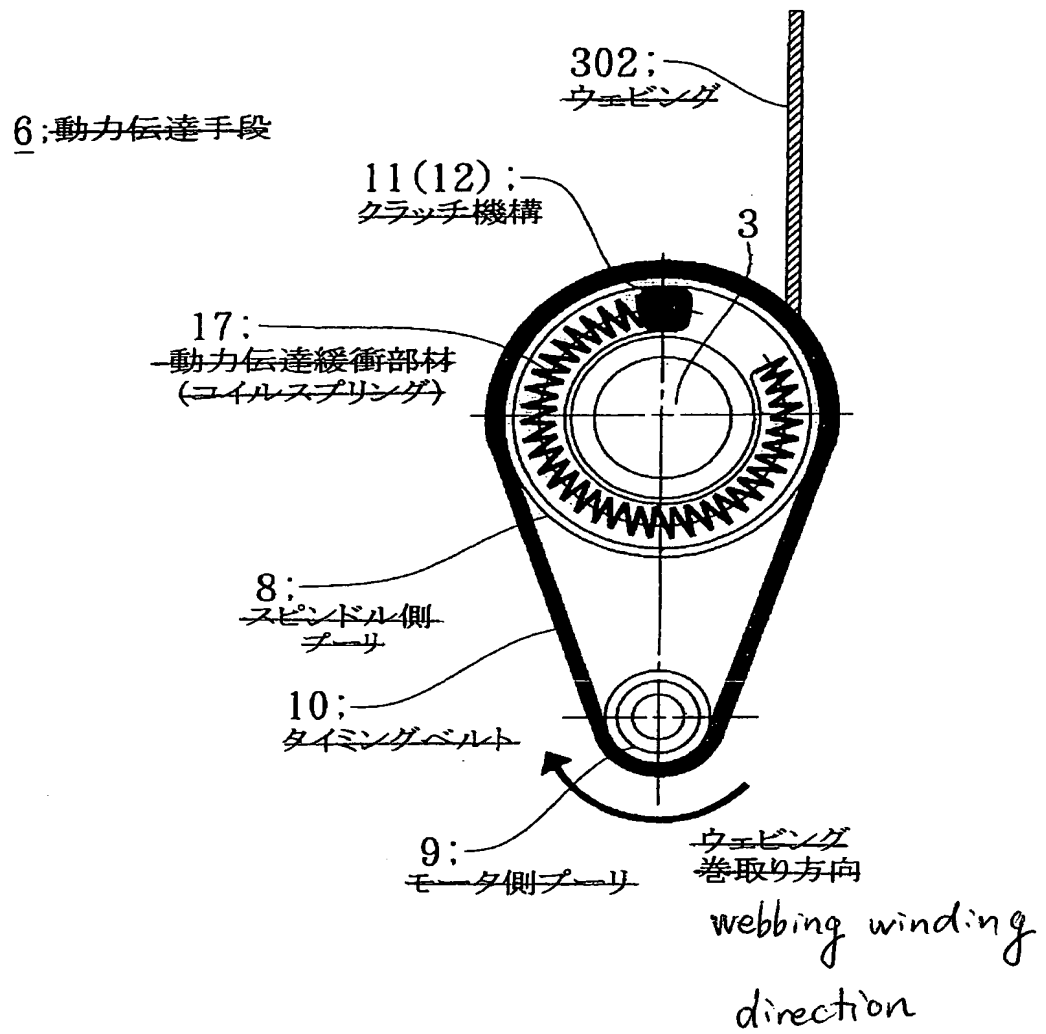
Fig. 1



第2図  
Fig. 2

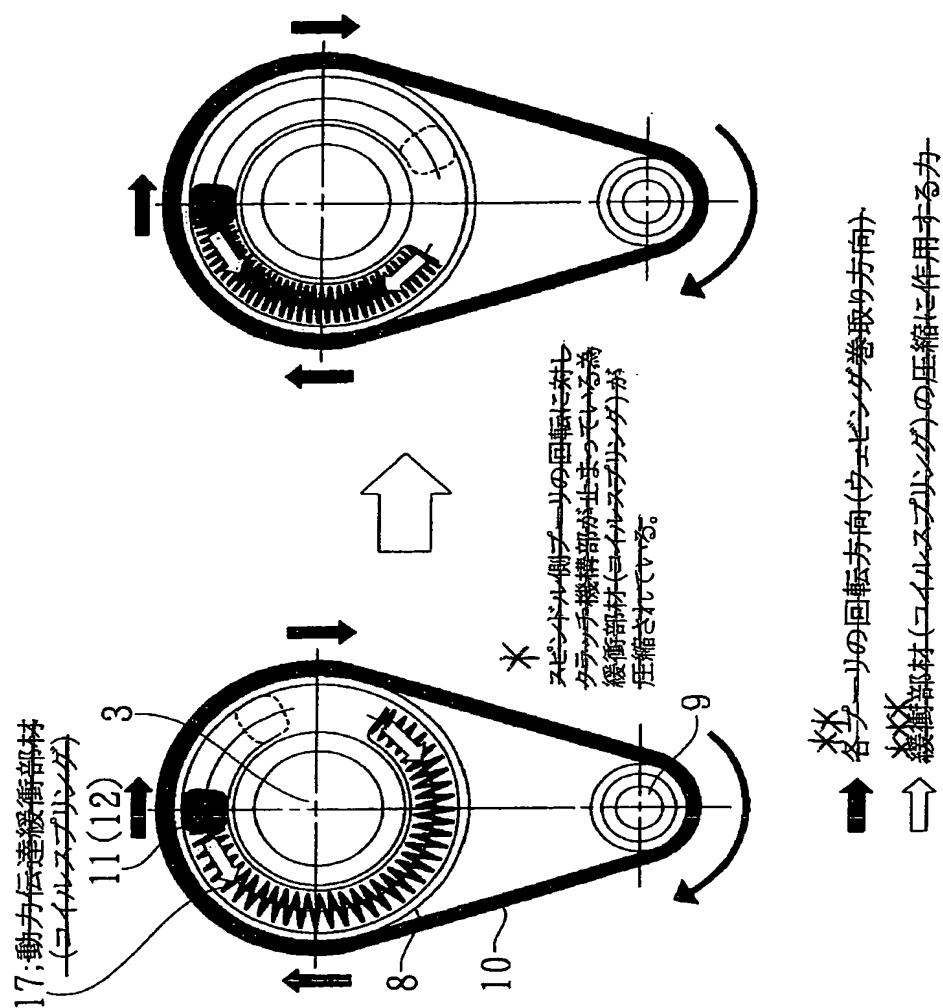


第3図  
Fig. 3



第4図

Fig. 4

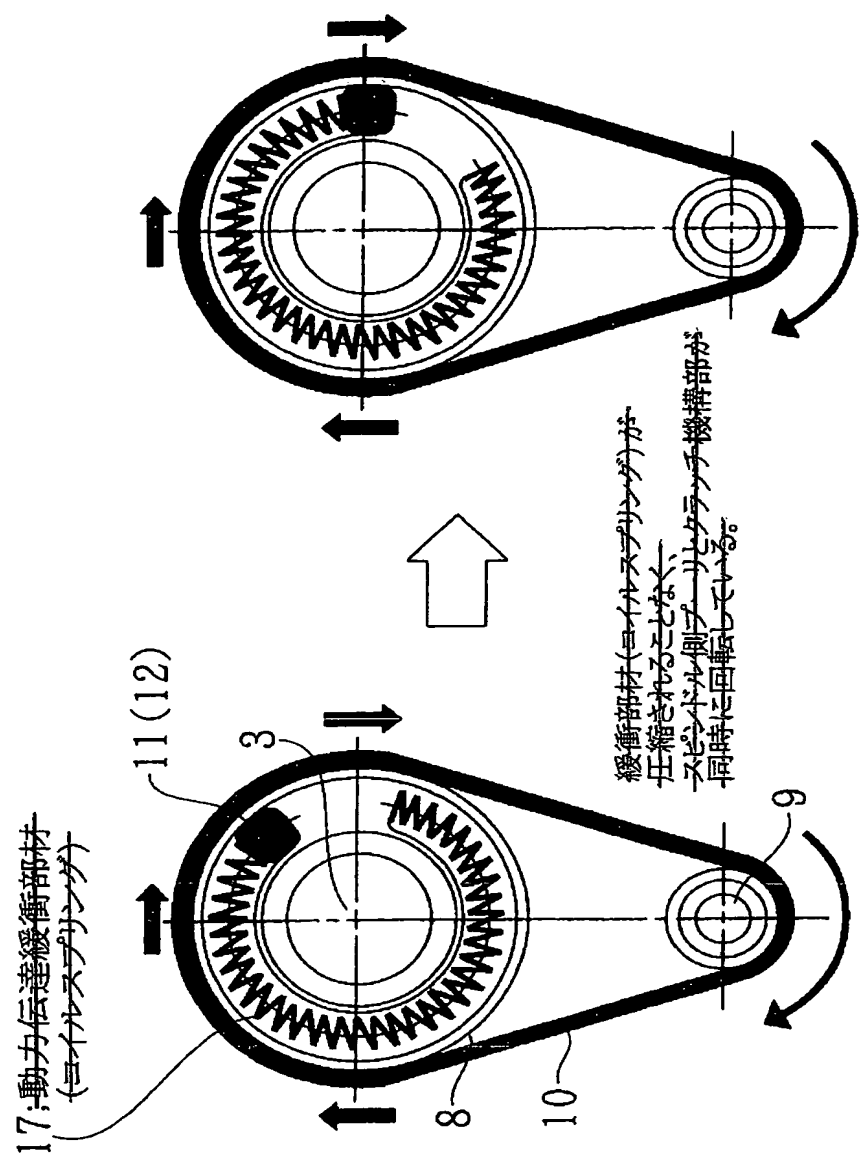


\* Since the clutch mechanism is stopped with respect to a rotation of the spindle side pulley, the cushion member (coil spring) is compressed.

\*\* Rotary direction of each pulley (webbing winding direction)

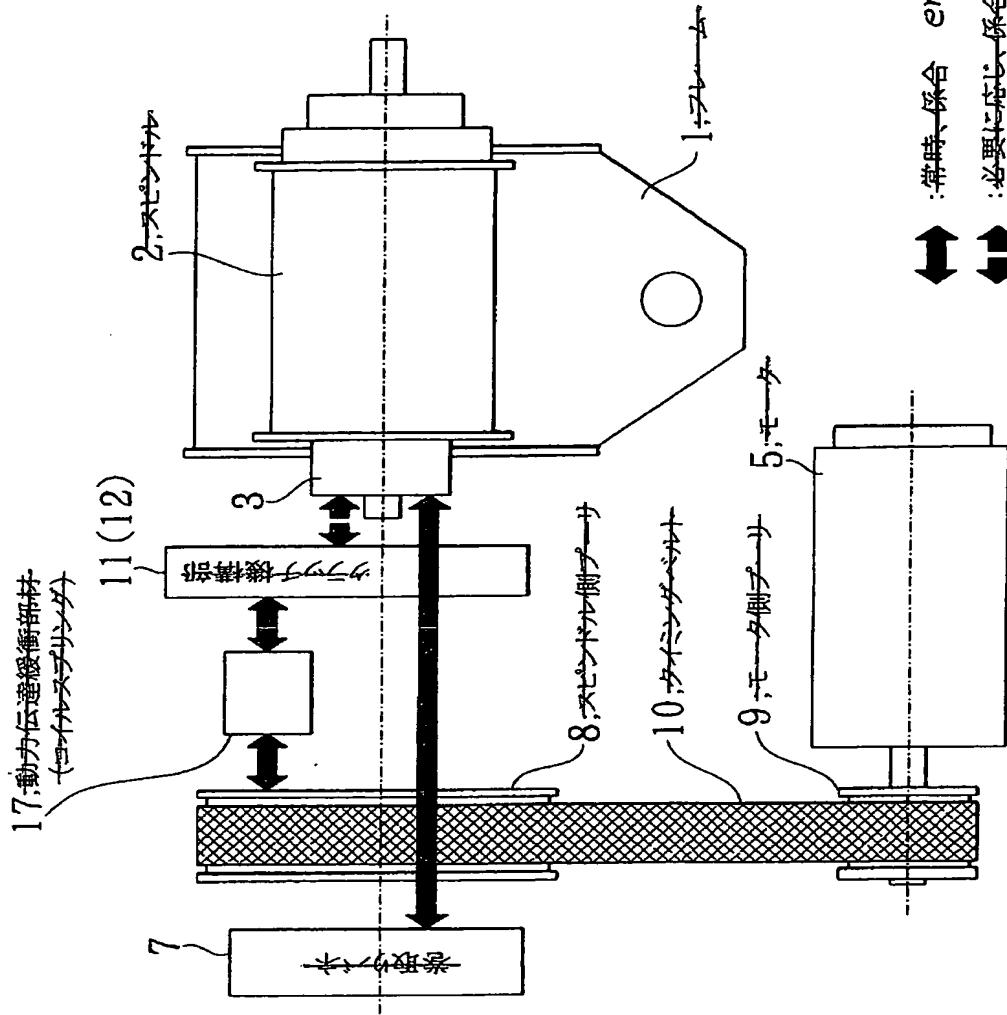
\*\*\* Force for compressing cushion member (coil spring)

第5図  
Fig-5



While the cushion member (coil spring) is not being compressed, the spindle side pulley and the clutch mechanism section are simultaneously rotated.

第6図  
Fig. 6



常時係合 engaged at all time  
 必要に応じて係合 engaged when necessary

第7図

Fig. 7

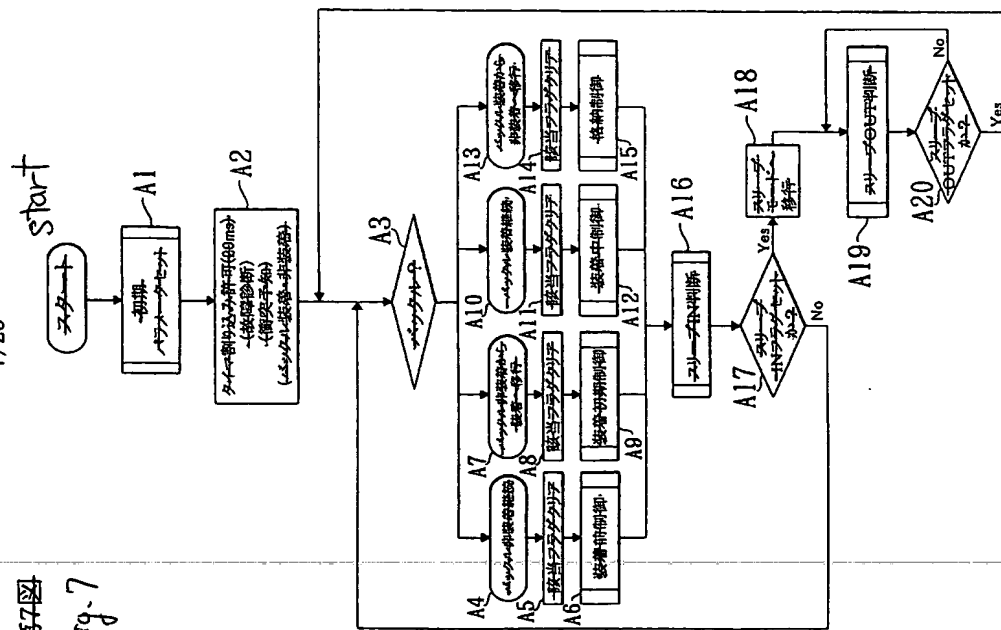


Fig. 7

A1 Set initial parameters

A2 Allow timer interruption (20 ms)

(Diagnosis of malfunction)

(Prediction of collision)

(Fastening buckle • not-fastening buckle)

A3 Buckle ?

A4 Continuation of not-fastening buckle

A5 Clear corresponding flag

A6 Prior fastening control

A7 Change from not-fastening buckle state to fastening buckle state

A8 Clear corresponding flag

A9 Initial fastening control

A10 Continuation of fastening buckle

A11 Clear corresponding flag

A12 Control during fastening

A13 Change from fastening buckle state to not-fastening buckle state

A14 Clear corresponding flag

A15 Control in accommodation

A16 Sleep IN judgment

A17 Is sleep IN flag set ?

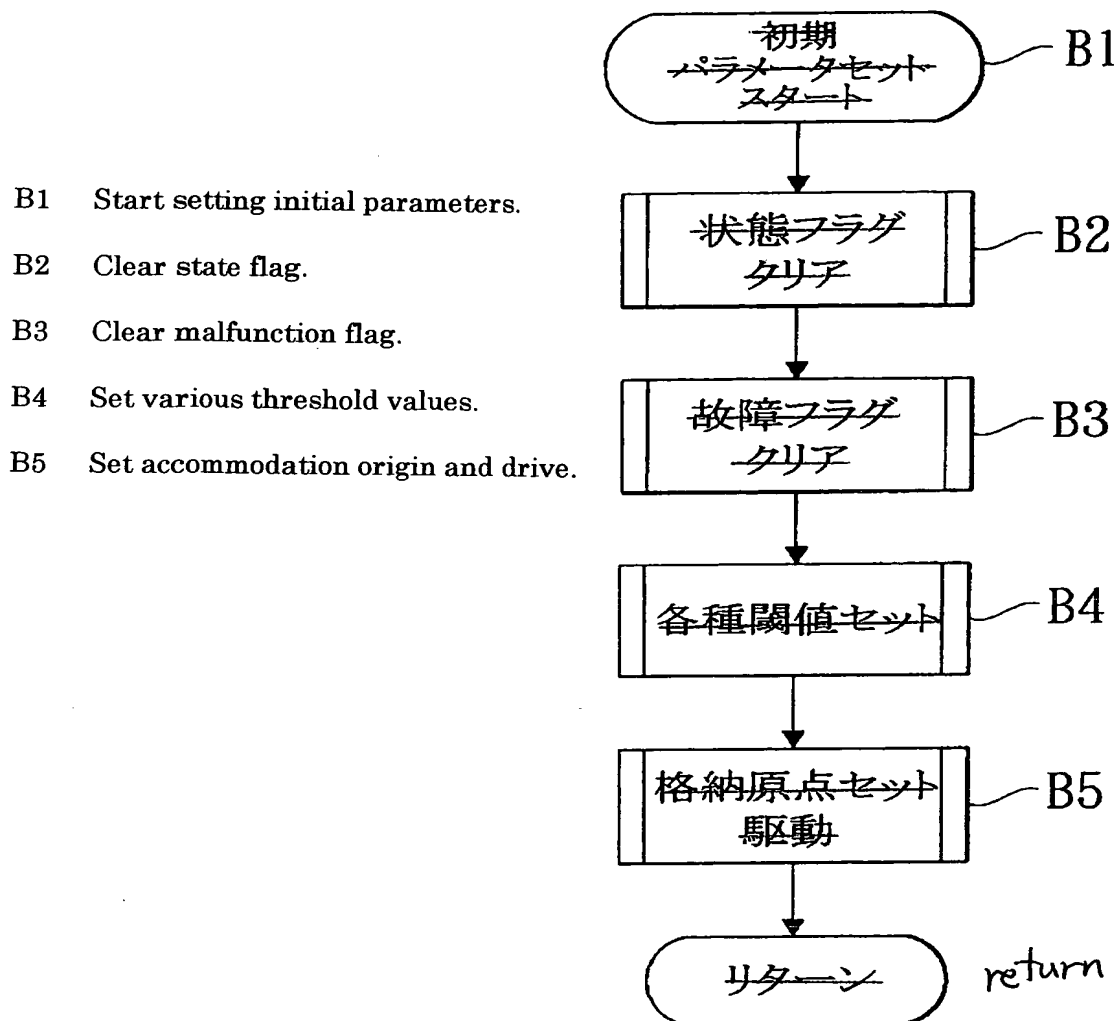
A18 Transfer to sleep mode.

A19 Sleep OUT judgment

A20 Is sleep OUT flag set ?

## 第8図

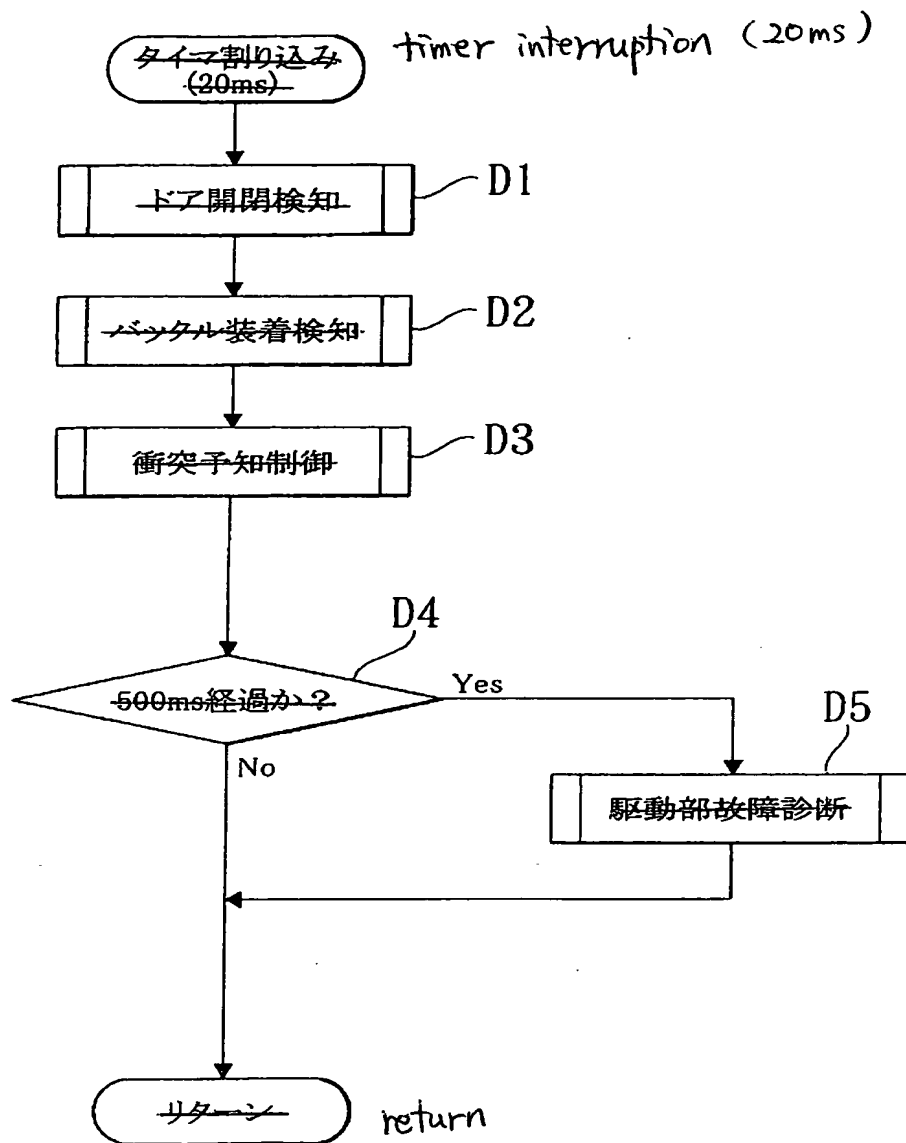
Fig. 8





第9図 Fig. 9

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D1 Detect opening and closing door.

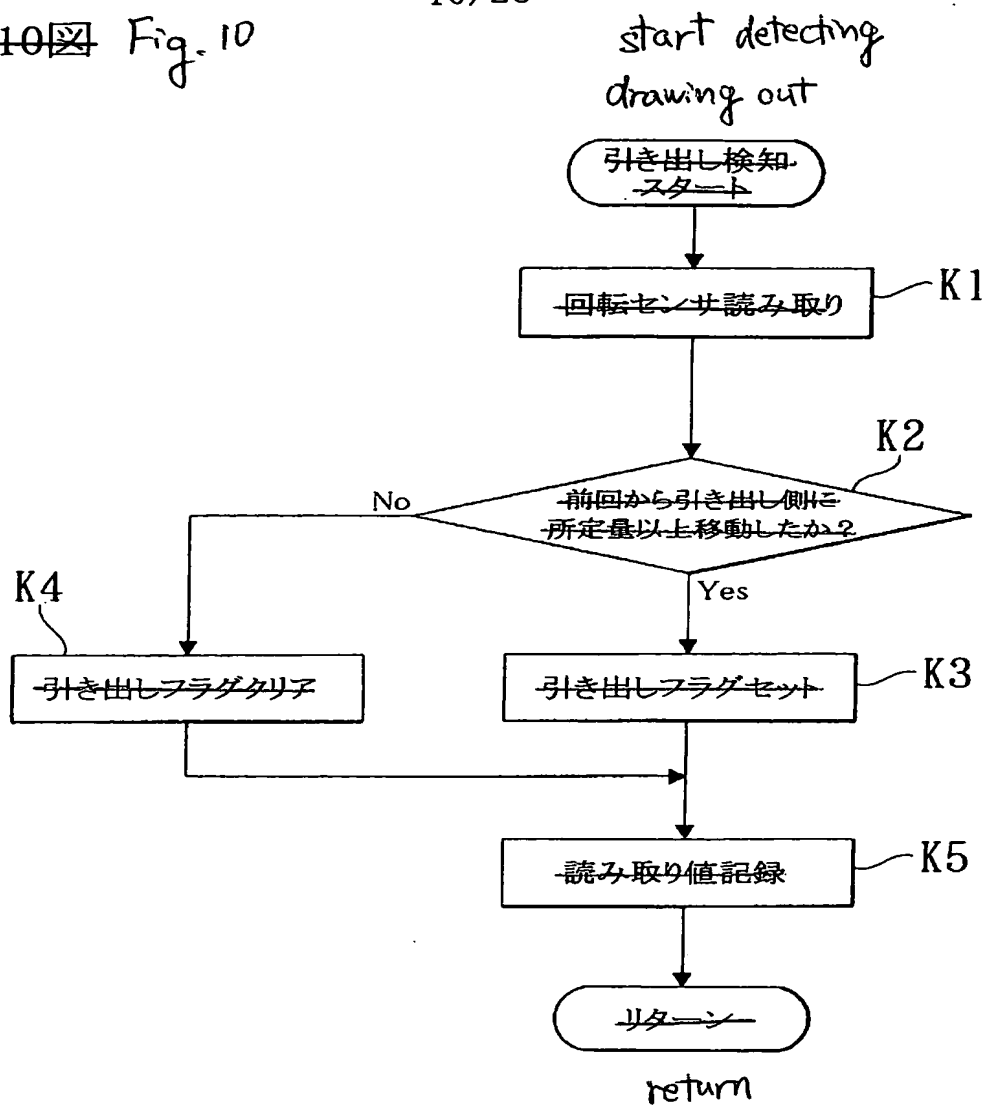
D2 Detect fastening buckle.

D3 Control predicting collision.

D4 Has the time of 500 ms passed ?

D5 Diagnosis of malfunction of drive section

第10図 Fig. 10



K1 Read out rotary sensor.

K2 Has webbing moved to drawing side by predetermined amount or more compared with amount of drawing of webbing of the last time ?

K3 Set drawing flag.

K4 Clear drawing flag.

K5 Record value read out.

Fig. 11

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第11図

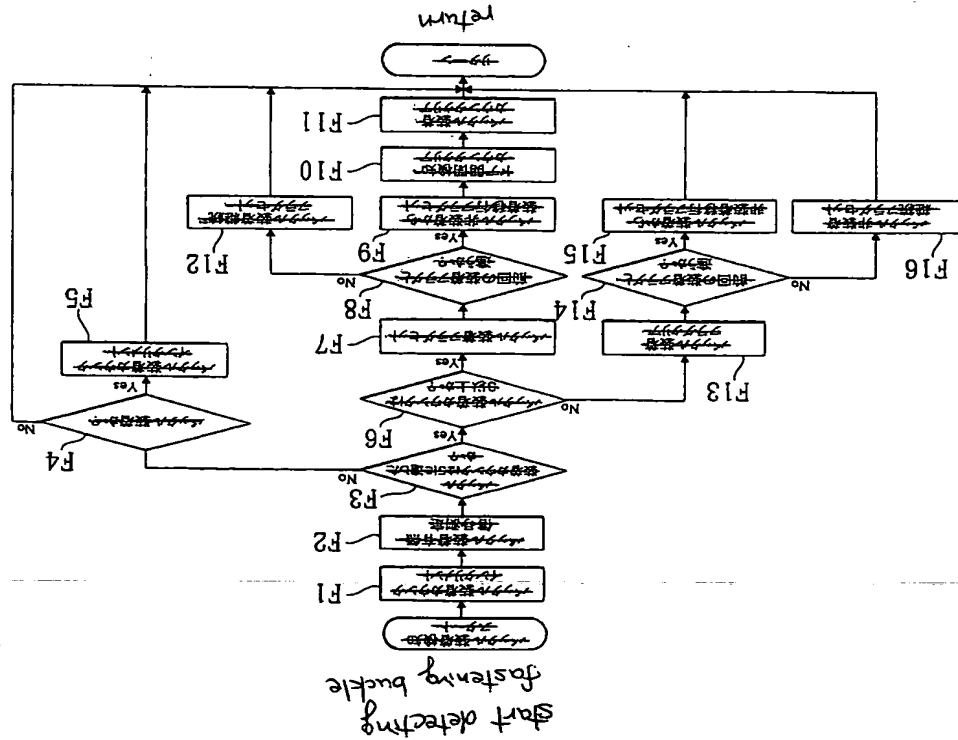


Fig. 11

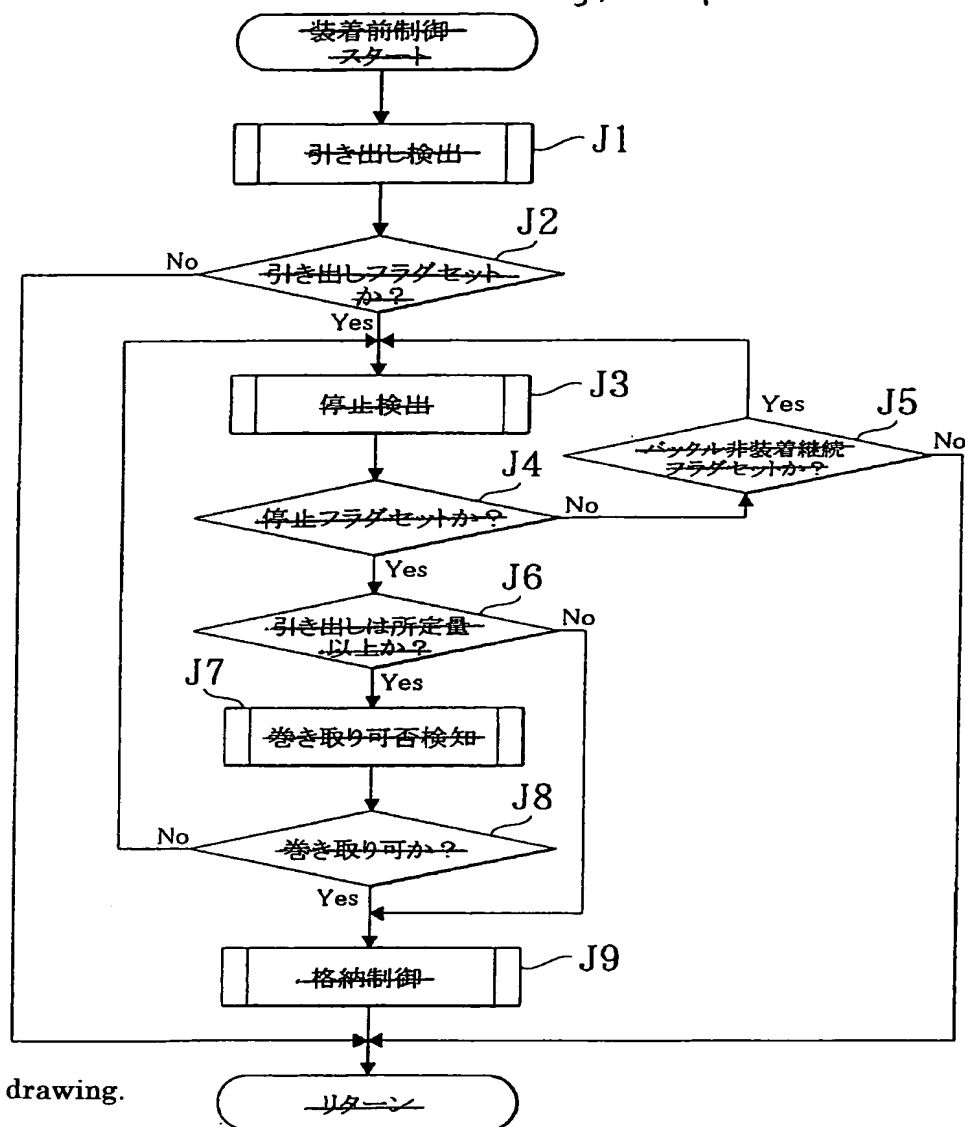
- F1 Make increment of buckle fastening counter.
- F2 Measure signal of fastening buckle.
- F3 Has buckle fastening counter reached 5?
- F4 Is buckle worn?
- F5 Make increment of buckle fastening counter.
- F6 Is buckle fastening counter 3 or more?
- F7 Set buckle fastening flag.
- F8 Is it different from fastening flag of last time?
- F9 Set flag of transfer from not-fastening of buckle to fastening of buckle.
- F10 Clear counter of detecting opening and closing door.
- F11 Clear counter of fastening buckle.
- F12 Set flag of continuation of fastening buckle.
- F13 Clear flag of fastening buckle.
- F14 Is it different from flag of fastening of last time?
- F15 Set flag of transfer from fastening of buckle to not-fastening of buckle.
- F16 Set flag of continuation of not-fastening buckle.

Fig. 12

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第12図

start prior fastening control



J1 Detect drawing.

J2 Is drawing flag set?

J3 Detect stoppage.

J4 Is stoppage flag set?

J5 Is flag of continuation of not-fastening of buckle set?

J6 Is drawing a predetermined amount or more?

J7 Detect suitability of winding.

J8 Is it suitable to wind?

J9 Control in accommodation.

return

第13図  
Fig. 13

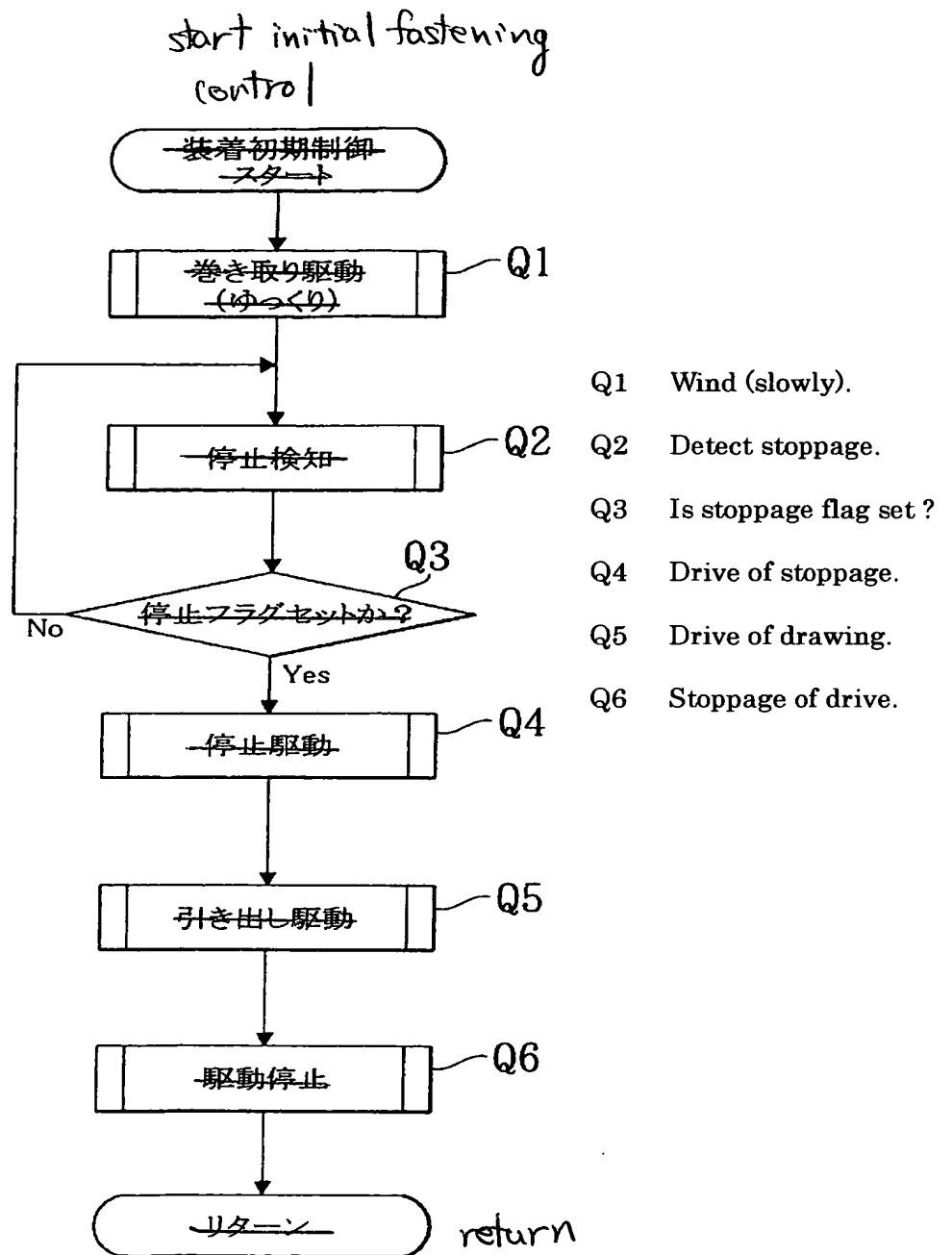


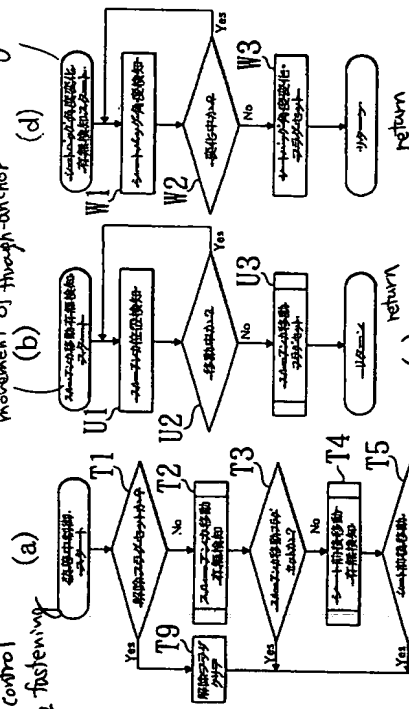
Fig. 14

第14図

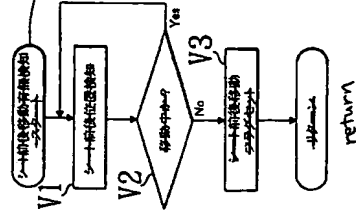
start control  
during fastening

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start detecting  
change in seat back  
angle  
start detecting  
movement of through-anchor



start detecting longitudinal  
movement of seat



(c)

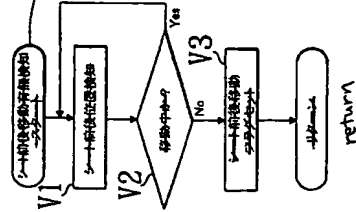


Fig. 14(a)

T1 Is release flag set ?

T2 Detect movement of through-anchor.

T3 Is through-anchor movement flag set ?

T4 Detect longitudinal movement of seat.

T5 Is flag of longitudinal movement of seat set ?

T6 Detect change in seat back angle.

T7 Is flag of change in seat back angle set ?

T8 Control of fastening at initial stage.

T9 Clear release flag.

Fig. 14(b)

U1 Detect position of through-anchor.

U2 Is it moving ?

U3 Set flag of movement of through anchor ?

Fig. 14(c)

V1 Detect longitudinal position of seat.

V2 Is it moving ?

V3 Set flag of longitudinal movement of seat.

Fig. 14(d)

W1 Detect seat back angle.

W2 Is it being changed?

W3 Set flag of change in seat back angle.

Fig. 15

第15図

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start control in accomodation

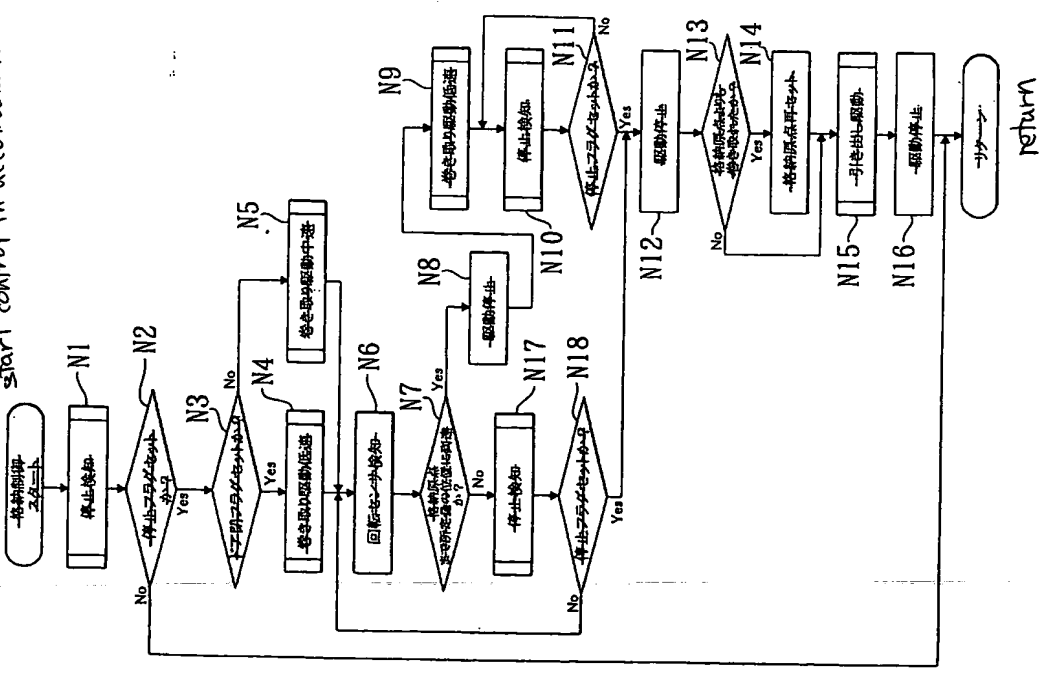


Fig. 15

N1 Detect stoppage.

N2 Is stoppage flag set ?

N3 Is flag of closing door set ?

N4 Wind at slow speed.

N5 Wind at middle speed.

N6 Detect by rotary sensor.

N7 Has it reached position of predetermined amount to accomodation origin ?

N8 Stop of drive.

N9 Wind at low speed.

N10 Detect stoppage.

N11 Is stoppage flag set ?

N12 Stop of drive.

N13 Is it wound exceeding accomodation origin ?

N14 Set accomodation origin again.

N15 Drive for drawing.

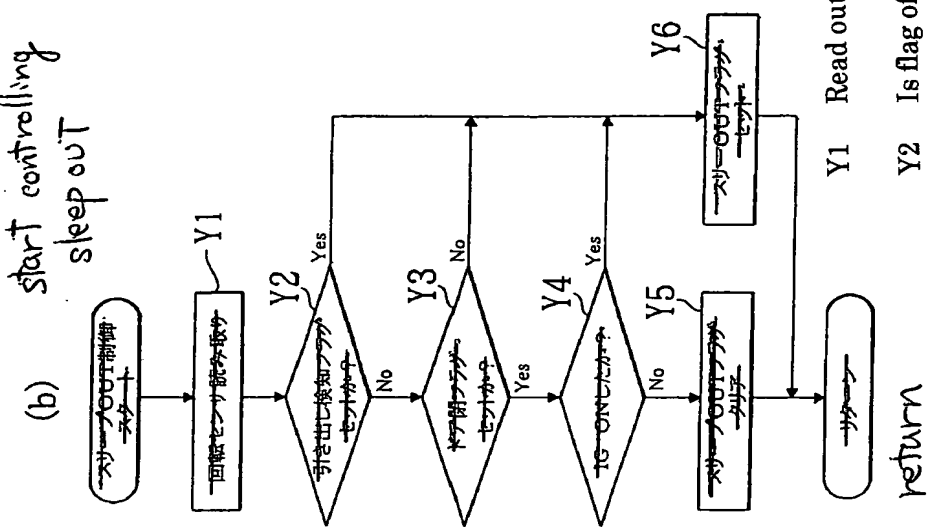
N16 Stop driving.

N17 Detect stoppage.

N18 Is stoppage flag set ?

Fig. 16  
第16図

(b) start controlling  
sleep OUT



Y1 Read out rotary sensor.

Y2 Is flag of detecting drawing set?

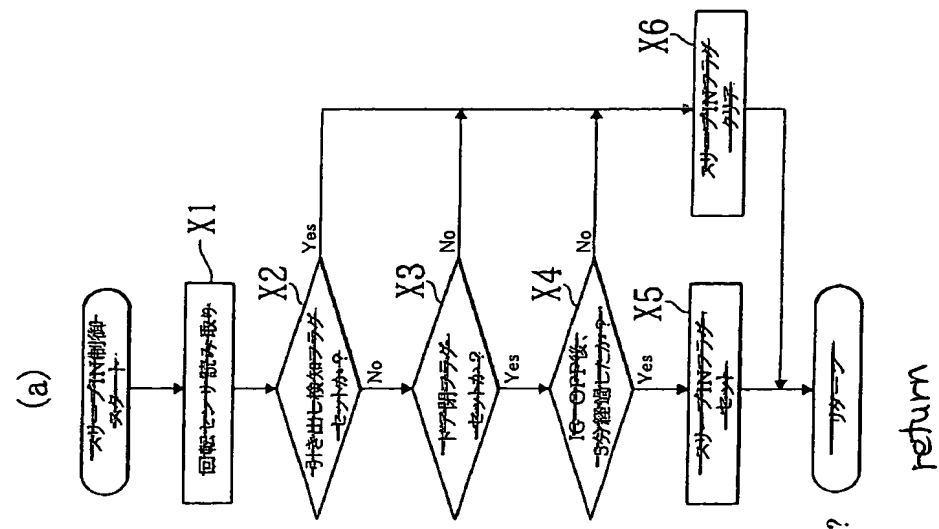
Y3 Is flag of closing door set?

Y4 Is IG turned on?

Y5 Clear sleep OUT flag.

Y6 Set sleep OUT flag.

(a) start controlling  
sleep IN



X1 Read out rotary sensor.

X2 Is flag of detecting drawing set?

X3 Is flag of closing door set?

X4 Has time of 5 minutes passed after OFF of IG?

X5 Set sleep IN flag.

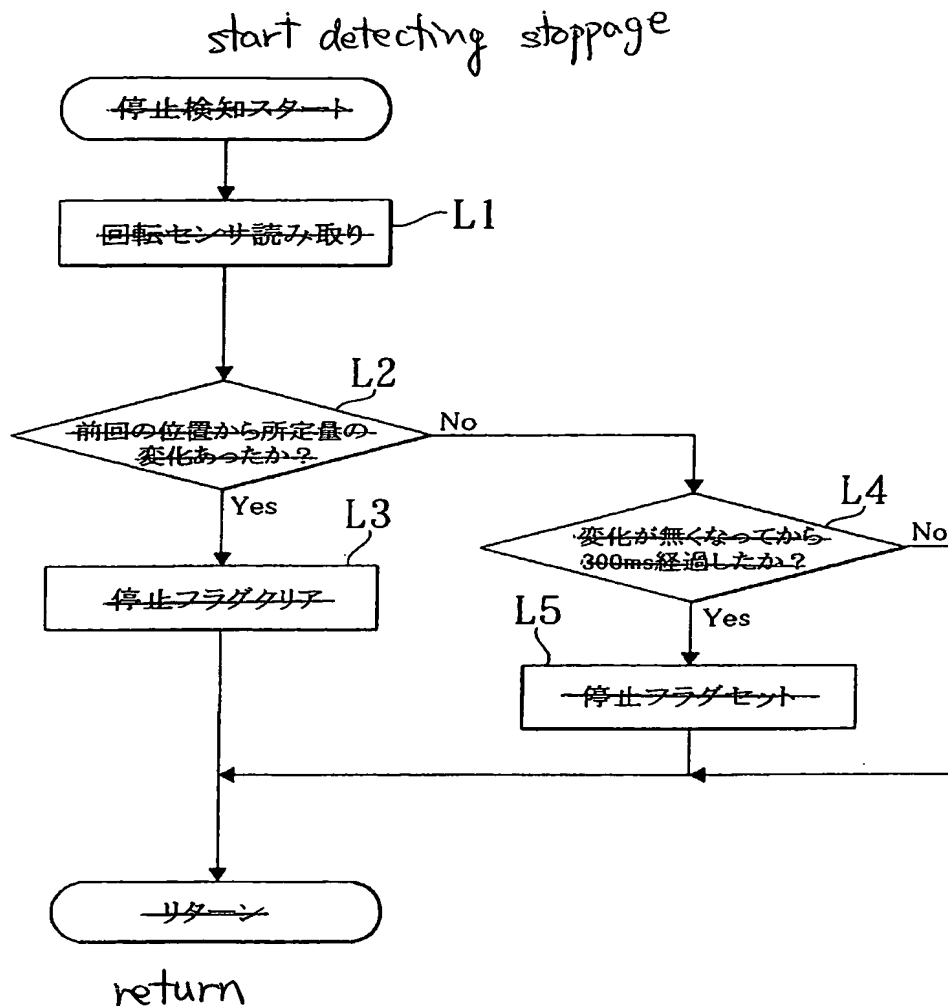
X6 Clear sleep IN flag.



Fig. 17

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第17図



L1 Read out rotary sensor.

L2 Is it changed by predetermined amount from position of last time ?

L3 Clear stoppage flag.

L4 Has time of 300 ms passed from when no change is caused ?

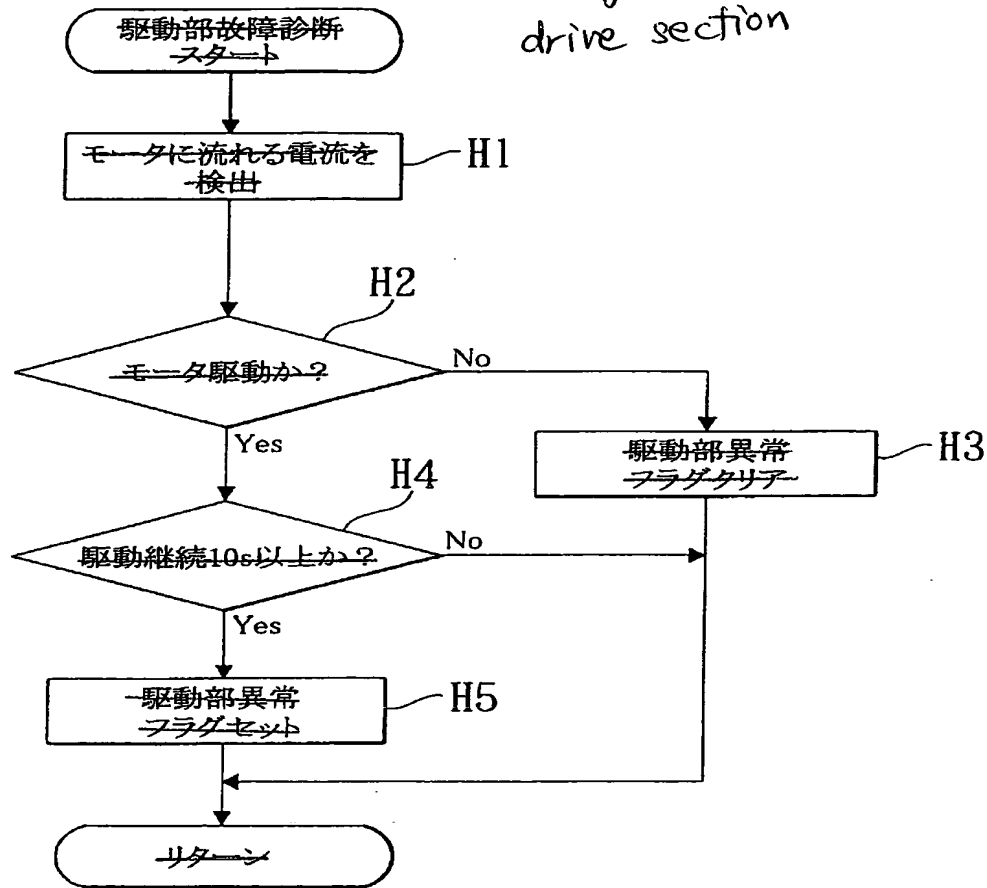
L5 Set stoppage flag.

Fig-18

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第18図

start diagnosis of malfunction of drive section



return

- H1 Detect electric current flowing in motor.
- H2 Is motor driven ?
- H3 Clear flag of abnormality of drive section.
- H4 Is drive continued not less than 10 seconds ?
- H5 Set flag of abnormality of drive section.

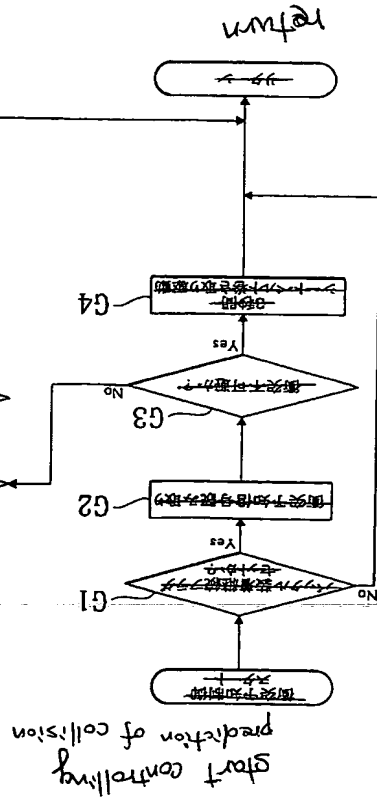
Fig. 19

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第19図

Fig. 19

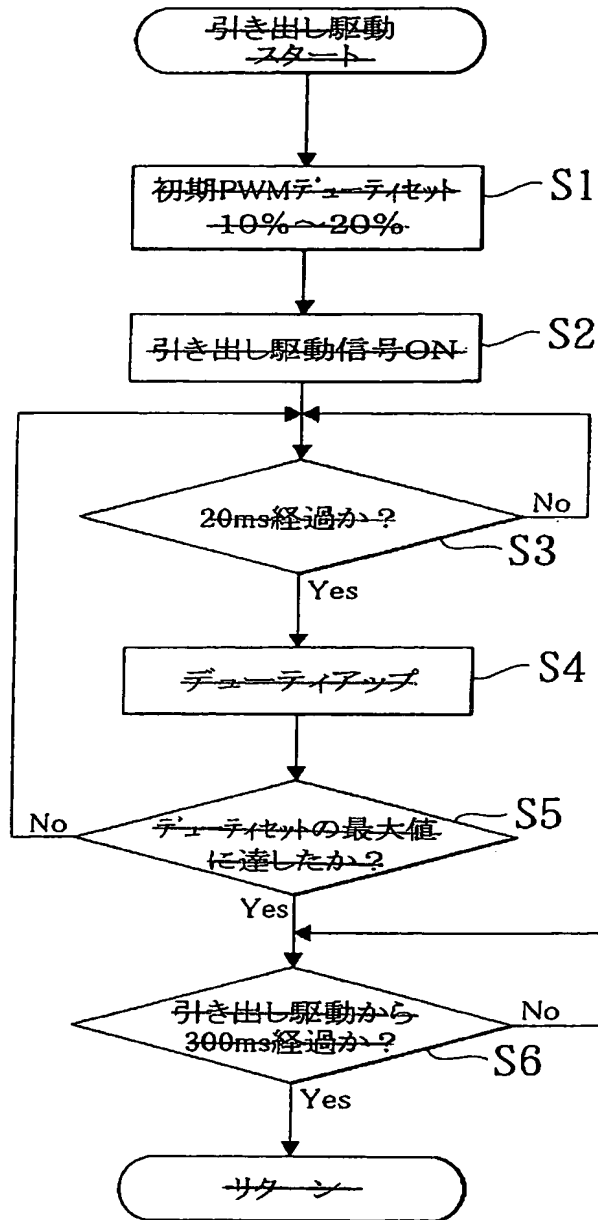
- G1 Is flag of continuation of fastening buckle set ?
- G2 Read out signal of prediction of collision.
- G3 Is it impossible to evade collision ?
- G4 Wind seat belt for 3 seconds.
- G5 Was it impossible to evade collision last time ?
- G6 Set release flag.
- G7 Is there possibility of collision ?
- G8 Wind and draw out seat belt.
- G9 Was there possibility of collision last time ?
- G10 Has time of 1 second or more passed after there was no possibility of collision ?
- G11 Set release flag.



第20図

Fig. 20

start drawing out drive



return

S1 Set initial PWM duty ratio.

10% to 20%

S2 Turn on drive signal of drawing.

S3 Has time of 20 ms passed ?

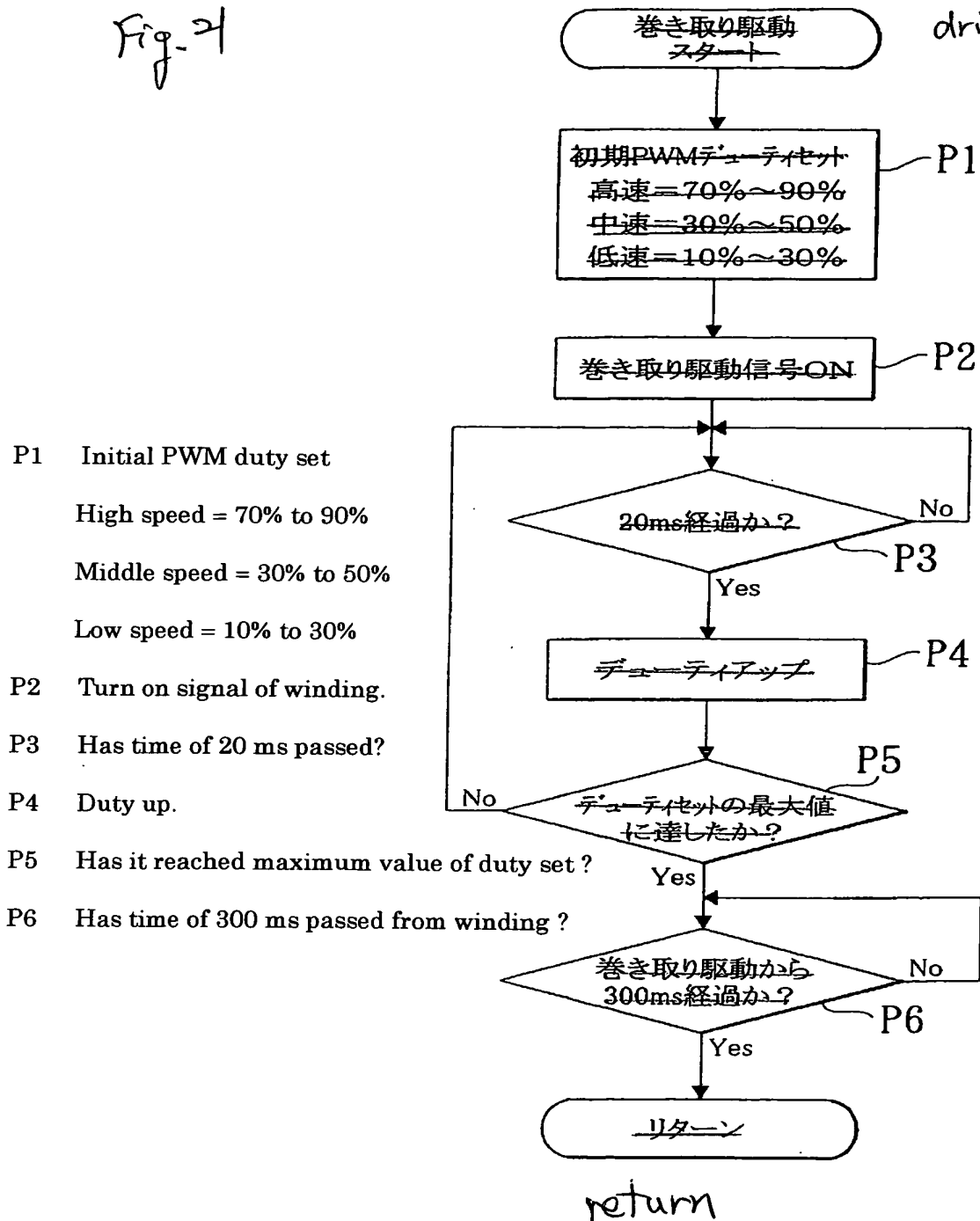
S4 Duty up.

S5 Has it reached maximum value of duty set ?

S6 Has time of 300 ms passed after drawing ?

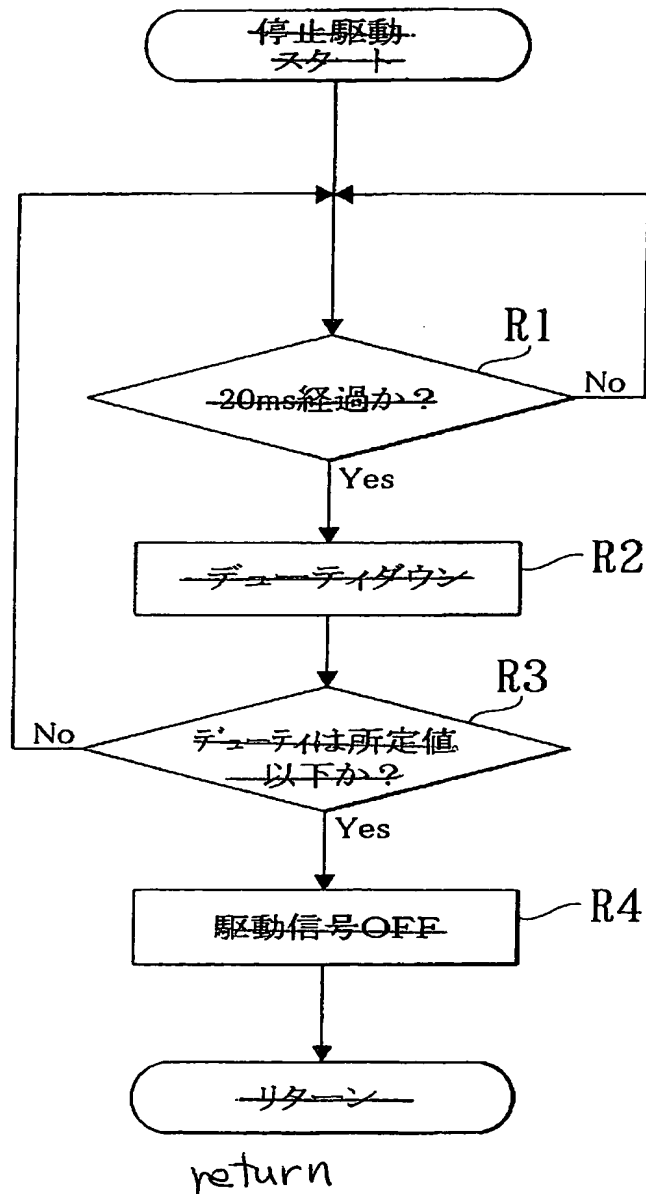
第21図

Fig. 21

start winding  
drive

~~第22図~~  
Fig. 22

start stoppage drive



R1 Has time of 20 ms passed ?

R2 Duty down.

R3 Is duty predetermined value or less ?

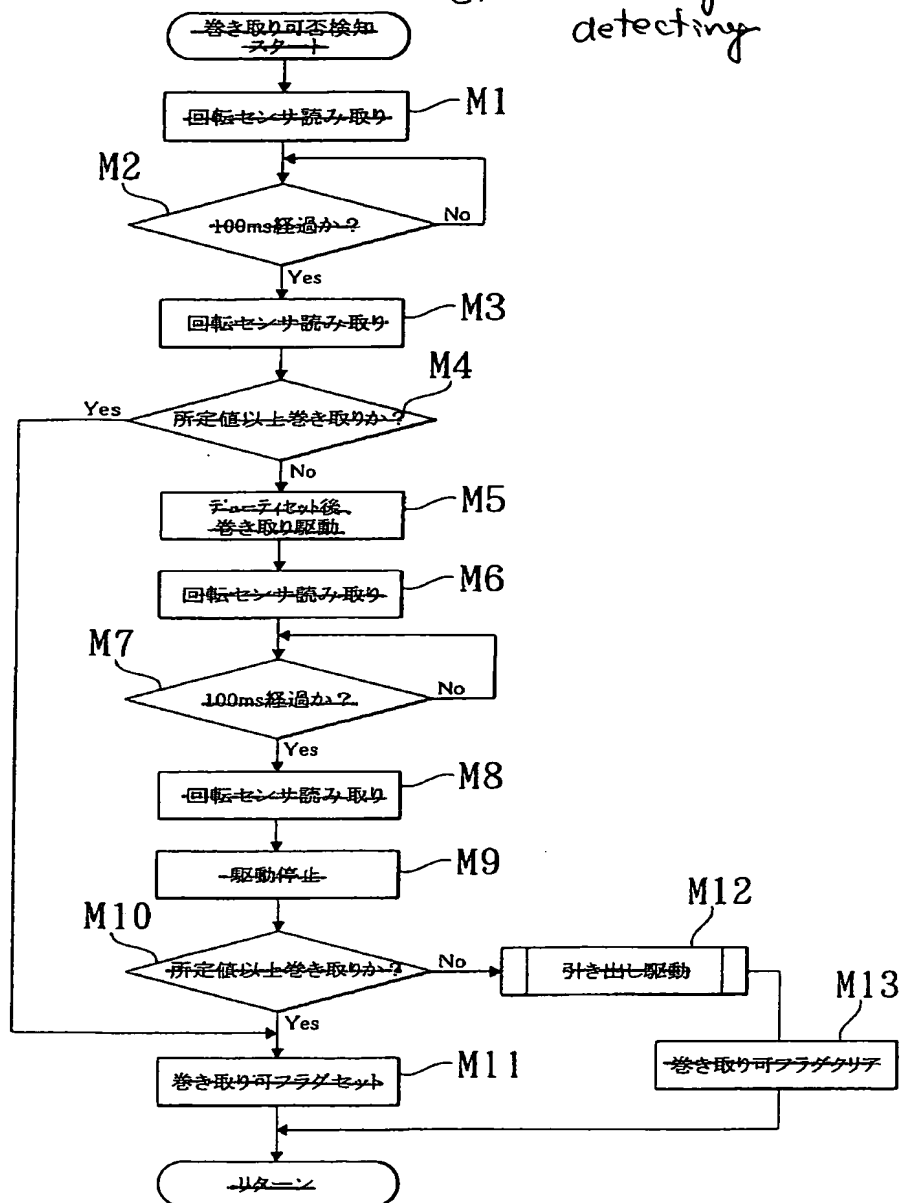
R4 Turn off drive signal.

Fig. 23

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第23図

start winding suitability detecting



return

M1 Read out rotary sensor.

M2 Has time of 100 ms passed ?

M3 Read out rotary sensor.

M4 Is it wound exceeding predetermined value ?

M5 Wind after duty set.

M6 Read out rotary sensor.

M7 Has time of 100 ms passed ?

M8 Read out rotary sensor.

M9 Stop driving.

M10 Is it wound exceeding predetermined value ?

M11 Set flag of allowing to wind.

M12 Draw out.

M13 Clear flag of allowing to wind.

Fig. 24  
第24図

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start driving for setting  
accommodation origin

C1 PWM duty set.

C2 Turn on driving signal of winding.

C3 Has predetermined period of time passed ?

C4 Detect stoppage.

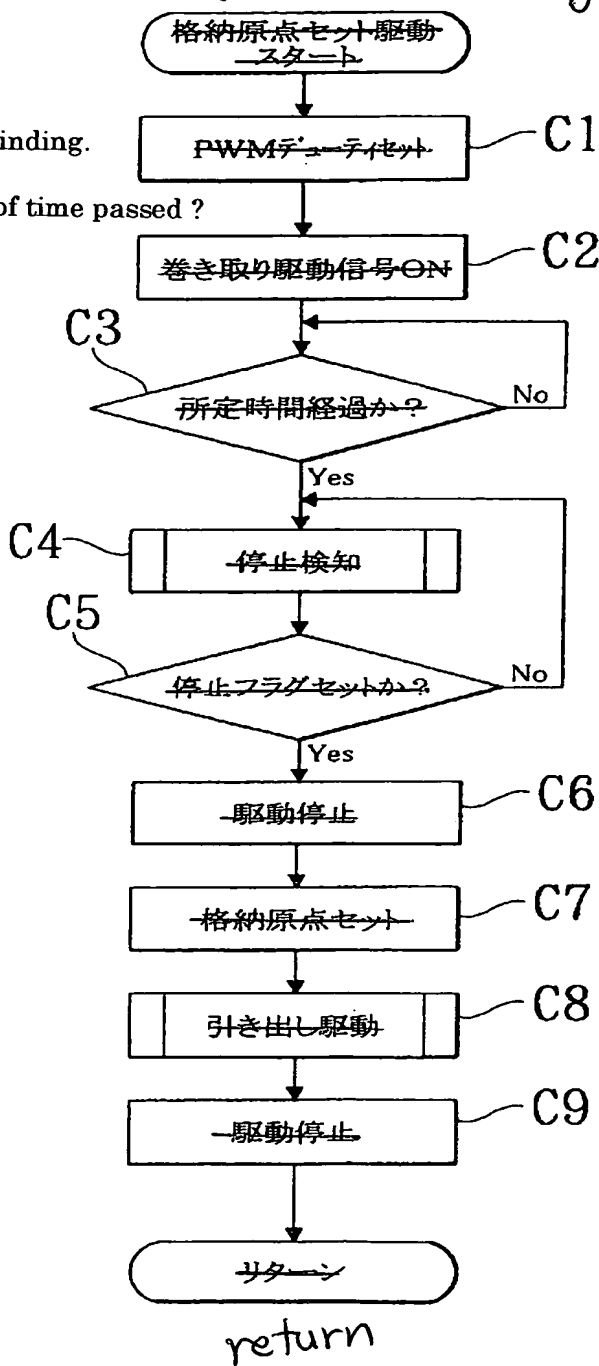
C5 Is stoppage flag set ?

C6 Stop driving.

C7 Set accommodation origin.

C8 Draw out.

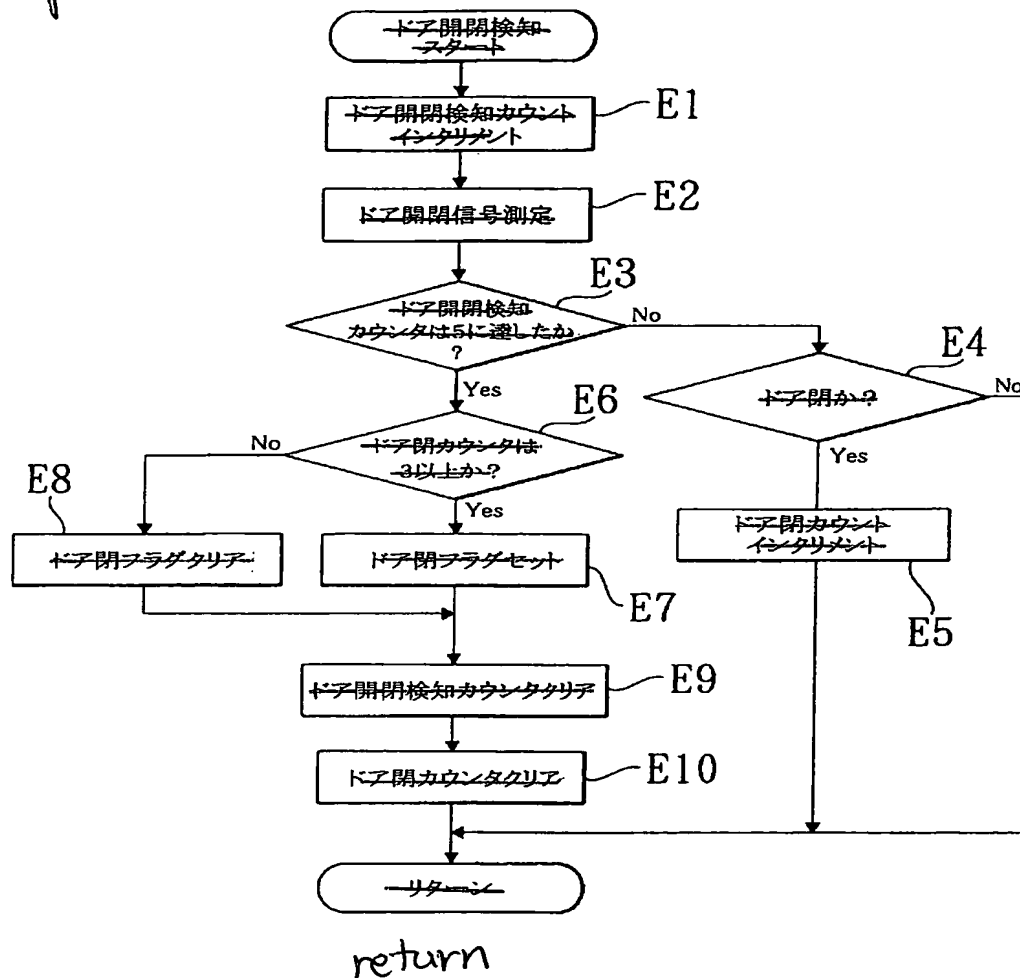
C9 Stop driving.





第25図  
Fig. 25

start detecting open and close of door



return

- E1 Make increment of door opening and closing detection counter.
- E2 Measure opening and closing signal of door.
- E3 Has door opening and closing detecting counter reached 5 ?
- E4 Is door opened ?
- E5 Make increment of door closing counter.
- E6 Is door closing counter 3 or more ?
- E7 Set door closing flag.
- E8 Clear door closing flag.
- E9 Clear door opening and closing detecting counter.
- E10 Clear door closing counter.